

LUBRICATED FISHING BUMPER SUBS

Instruction Manual 4445



Lubricated Fishing Bumper Subs

One Company Unlimited Solutions

NOV NATIONAL OILWELL VARCO

Lubricated Fishing Bumper Subs

INDEX

Lubricated Fishing Bumper Subs	
General Description	3
Use	3
In Fishing Operations	3
Construction	4
Exploded View	5
Operation	6
When Used in Light Drilling, Milling, or Coring Operations	6
When used in Fishing Operations	6
To "Bump Down" in the Hole	6
To Bump a Solid Downward Blow in the Hole	6
To "Jar Up" in the Hole	6
Complete Disassembly	6
Reassembly	7
To Fill the Lubricated Fishing Bumper Sub	8
Strength Data	13
Service Kit	14
Specifications and Replacement Parts	15 – 18

The designs and specifications for the tools described in this instruction manual were in effect at the time this manual was approved for printing. National Oilwell Varco, whose policy is one of continuous improvement, reserves the right to discontinue models at any time, or to change designs and specifications without notice or without incurring obligation.

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General Description

The **Bowen Lubricated Fishing Bumper Sub** is engineered to withstand sustained bumping action in fishing, milling, and workover operations. The tool is designed to permit a 10" to 18" vertical stroke, either upward or downward. This stroke is always available to the operator, whether rotating or not. Strokes greater than 18" can be furnished on special request. The Bowen Lubricated Fishing Bumper Sub will transmit full torque at all times during rotation and during bumping operations.

Adequate striking surfaces are provided at the limits of the free movement to produce the great impact so necessary to get high quality, positive bumping action in either direction.

Specially designed rugged splines provide a source of continuous torque transmission. These splines are always in engagement, whether bumping or not.

The bores permit full circulation at all times.

Use

The Bowen Lubricated Fishing Bumper Sub is especially well-suited for use in deep, severe fishing operations or light drilling, milling, or coring operations. It permits an immediate bumping action to prevent cuttings and cavings from settling and wedging the drilling or fishing string.

The Bowen Lubricated Fishing Bumper Sub will free drill pipe and reamers, drill collars, bits and other tools which have become stuck. The tool can readily be used to bump repeatedly in either direction or to bump alternately up and down.

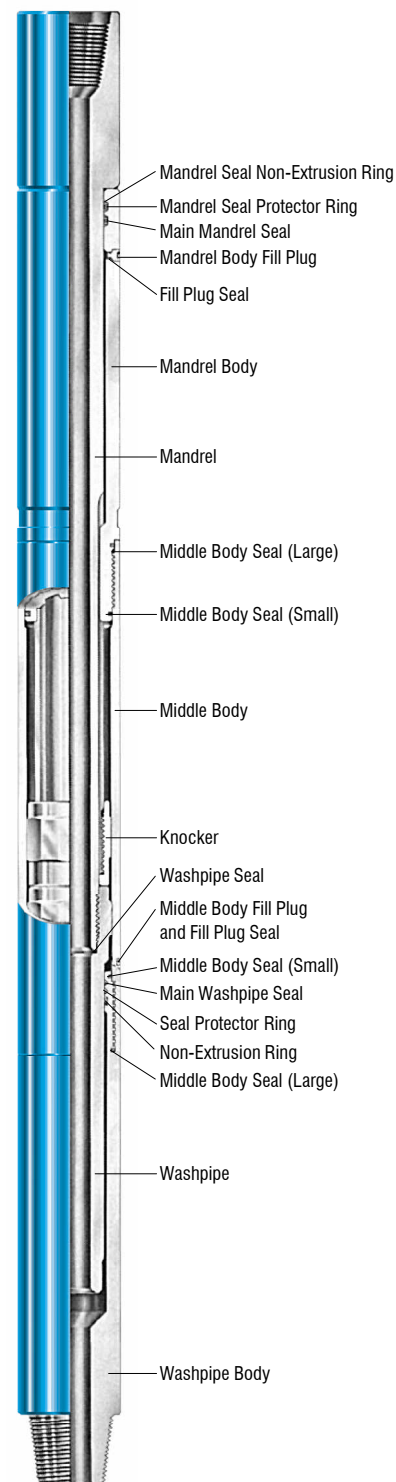
The Bowen Lubricated Fishing Bumper Sub is an ideal tool to be used in coring operations. The bumping action is an effective way to break cores sharply and cleanly to permit easy removal when desired.

In Fishing Operations

Whenever a releasing type fishing tool is to be used, a properly made-up Bowen Lubricated Fishing Bumper Sub should be included in the fishing string. It is generally inserted in the string immediately above the fishing tool safety joint or unlatching joint. It insures that the operator has the means available to release the fishing tool if and when it becomes impossible to pull the fish.

The Bowen Lubricated Fishing Bumper Sub will deliver the sharp downward blow and transmit the torque required to break the fishing tool engagement to release it from the fish. The freestroke also assists in controlling the weight on the fishing tool while releasing.

Likewise, the Bowen Lubricated Fishing Bumper Sub can be used to great advantage to release a fishing tool from a recovered fish at the top of the hole, once recovered. It simplifies the operation and eliminates the necessity to resort to awkward measures such as dropping the elevators or bumping down with the hook.



Lubricated Fishing Bumper Sub

Construction

Refer to the assembly drawing on page 5.

The Bowen Lubricated Fishing Bumper Sub is manufactured from carefully selected high grade alloy steel. Each part is processed and heat treated in accordance with best choice of degree and type of heat treatment to suit its use in the tool.

Careful engineering has eliminated to a high degree points of usual high stress concentration. This assures long dependable service from each tool.

A shoulder type, splined Mandrel fits in to a Mandrel Body with mating splines. The Mandrel is free to move up and down, while simultaneously transmitting torque from the Mandrel to the Mandrel Body. A suitable Kicker and Washpipe are made up on the lower end of the Mandrel.

The Kicker strikes a heavy impact blow against the lower end of the Mandrel Body when in use. This Kicker is specially designed with three main features: its material and heat treatment are designed to be in optimum balance for use in impact loading; it is designed to reduce wear to an absolute minimum; and it has been closely fitted to allow free sliding contact with the Middle Body, in which it translates, while at the same time lateral movement is restricted to an absolute minimum. This prevents the high frequency lateral vibration which is present in most other tools, and which is very detrimental to the life of the tool. This is wear action commonly called "chatter."

The Washpipe is designed to include the same stabilizing features at its upper end as those described above. The lower end, which moves up and down as the tool is stroked, has been specially hardened and ground to a high polish. This reduces frictional wear to a minimum where the Washpipe is sealed in the upper end of the Washpipe Body.

The seal points of the Mandrel at the top of the tool and the Washpipe at the bottom of the tool are equipped with the well-known patented Seal Ring Assembly, consisting of an O-Ring Seal, Non-Extrusion Rings, and Seal Protector Rings. This Seal Ring Assembly reduces the normal diametral clearance at the seal point to near zero as hydraulic pressure is applied from either direction. This prohibits the extrusion of the Seal Ring as would otherwise occur. It also reduces O-Ring "roll" to a minimum. Two of these Seal Assemblies are used in tandem in the Bowen Lubricated Fishing Bumper Sub. This increases the life of both by a considerable margin.

The Middle Body forms a housing for the lubricating oil in which the working parts of the Bumper Sub function.

It is made up on the Mandrel Body at its upper end, and on the Washpipe Body at its lower end. The Middle Body has a suitable Fill Plug near the lower end. It has a honed finish inside diameter which is closely fitted to the outside diameter of the Kicker and Washpipe upper end.

The Mandrel Body slips over the Mandrel with the flat end up. It is made up with the Middle Body at its lower end. The Mandrel Body incorporates splines, which mate with corresponding splines on the Mandrel.

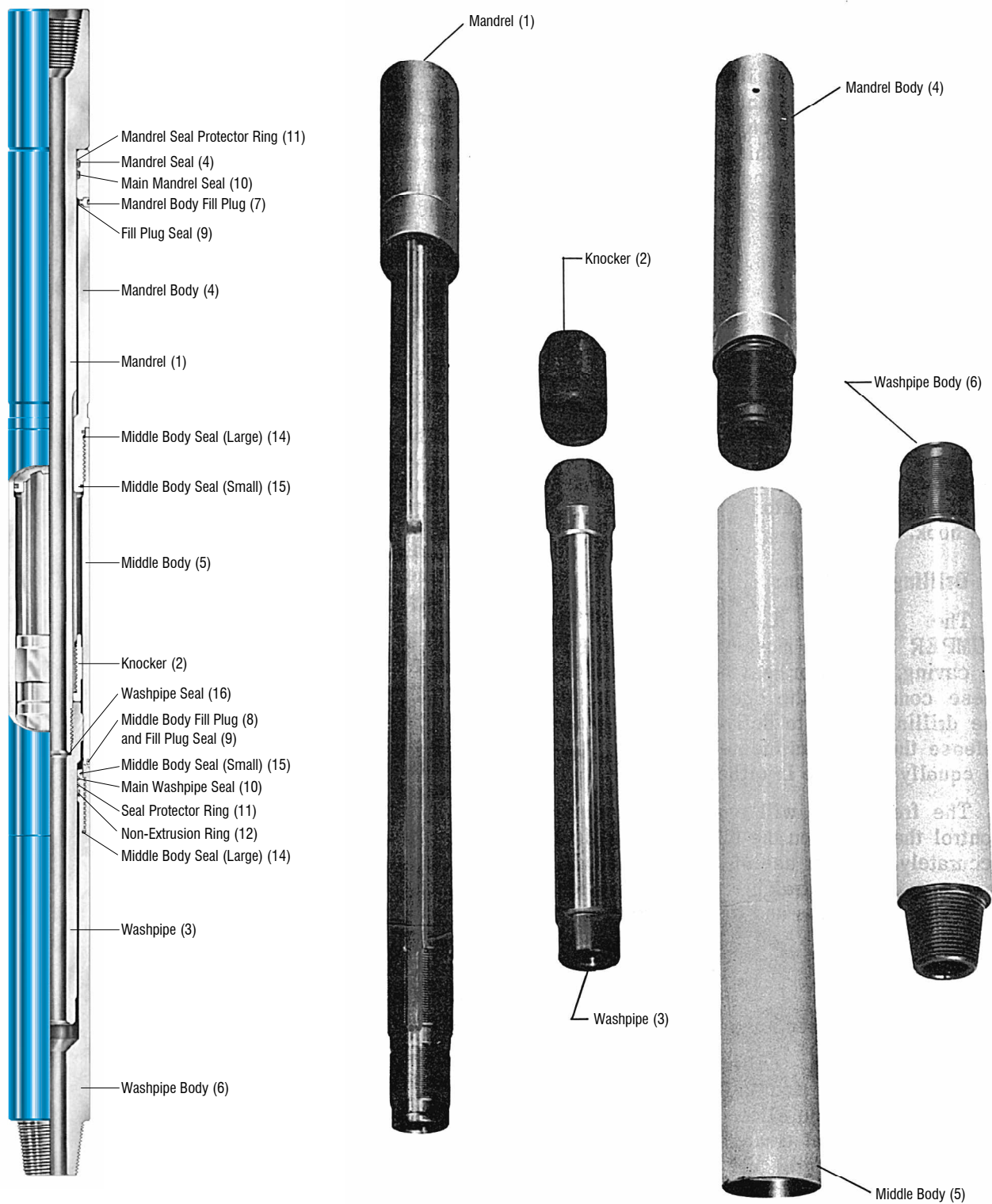
The Mandrel Body has a suitable Fill Plug, which, together with the similar Fill Plug in the Middle Body, allow filling the Bumper Sub with lubricating oil. This filling process is described in detail on page 8.

The Mandrel Body also has a series of straight, specially designed splines on its inside diameter and near the lower end. These splines are engaged in sliding contact with the Mandrel to transmit the torque imparted by the running string through the Middle Body, Washpipe Body, and the attached tool.

The Washpipe Body is the lowermost part of the tool. Its function is to form the lower closure for the Middle Body (oil chamber) and to transmit torque.

The Bowen Lubricated Fishing Bumper Sub is furnished standard with a tool joint box top connection and a tool joint pin bottom connection. These may be reversed or special connections furnished on request.

The Bowen Lubricated Fishing Bumper Sub is designed to have a 10" to 18" stroke standard, depending on size. Special longer strokes can be furnished up to 60" or greater, depending on size. Contact National Oilwell engineering for information regarding a specific requirement.



Operation

When Used in Light Drilling, Milling, or Coring Operations

The Bowen Lubricated Fishing Bumper Sub is usually installed in the drill string immediately above the drill collars. The Bumper Sub serves several purposes as mentioned in "Use." It is an excellent safety device, particularly when working in sticky formations, deep holes, when drilling out cement in heavy mud, or in coring jobs.

When Used in Fishing Operations

The Bowen Lubricated Fishing Bumper Sub is usually installed in the fishing string immediately above the fishing tool, safety joint or unlatching joint.

The Bowen Lubricated Fishing Bumper Sub's primary purpose is to enable the operator to release the fishing tool in the event that it becomes impossible to pull the fish. It will deliver the necessary impact and impart the required torque that is required to release the tool from the fish. It will also assist in controlling the weight on the fishing tool while releasing.

There are a number of secondary uses for the Bumper Sub:

To Release the Recovered Fish at the Top of the Hole

This is accomplished by gripping the fish immediately below the fishing tool and, after opening the Bowen Lubricated Fishing Bumper Sub, dropping a stand of drill pipe heavily down against the Bumper Sub. This will cause a sharp enough downward blow against the fishing tool to break the "freeze," after which the fish may readily be removed. In the event that insufficient impact may be produced by the stand of drill pipe, one or more drill collars may be inserted in place of the drill pipe, and the process repeated with more effect.

To "Bump Down" in the Hole

Elevate the fishing string sufficiently to open the Bumper Sub the full length of its stroke and take a strain on the pipe. This will require 10" to 18" to open the tool. Add enough pull to put a permissible amount of stretch in the drill or fishing string. The permissible stretch will depend on the size of the pipe and its length above the Bumper Sub.

Drop the string sharply for a distance equal to the stretch in the string plus 9¹/₂" to 12", depending on the size of the tool; and stop it abruptly with the break. If sufficient stretch has been taken in the string, this will cause the lower end of the fishing string, i.e., immediately above the tool, to spring downward, closing the Bumper Sub. Due to the elasticity of the string, coupled with the natural rebound from the striking surfaces in the tool, a rapid series of resonant blows will be delivered to the tool below the Bumper Sub.

To Bump a Solid Downward Blow in the Hole

Elevate the string to open the Bumper Sub completely, and take a moderate strain or stretch in the string. This will require 15" to 20" at the tool plus stretch in the string.

Drop the running string sharply this full combined length without any braking action. This will cause the Bumper Sub to close quickly. The shoulder of the Mandrel will strike the Mandrel Body shoulder, transmitting a single, solid downward blow to the tool below the Bumper Sub.

To "Jar Up" in the Hole

Elevate the running string sufficiently to stretch it moderately. Then drop the string a distance equal to the stretch in the string and stop it sharply with the brake. This will cause the lower end of the string to spring downward, causing the Bumper Sub to partly close, after which the string will rebound. This will

cause the Bumper Sub to re-open quickly and the Knocker will strike the lower end of the Mandrel Body a solid upward blow.

Complete Disassembly

1. Place the Bumper Sub in a chain pipe vise, clamping the tool at the Mandrel Body (4). This has two advantages: the main Mandrel Body is thick walled and will withstand greater forces exerted upon it, and the entire disassembly can be accomplished with this single clamping.
2. Remove Middle Body Fill Plug (8) so that oil may start draining from the tool.

Note: Place a suitable open mouthed receptacle below the tool so that it will catch the oil as it drains.

3. With chain tongs break the Washpipe Body (6) from the Middle Body (5). Uncouple and lay aside.
4. With chain tongs, break the Middle Body (5) from the Mandrel Body (4). Uncouple, slide over the Washpipe (3) and lay aside.

Caution: Do not scratch or dent Washpipe seal surface.

5. Break Washpipe from Mandrel (1) and lay aside.
6. Slide the Mandrel (1) out through the top of the Mandrel Body (4). Due to the tight grip of the Seal Assembly, it is sometimes necessary to strike the Mandrel to start it out. If so, the Mandrel end should be protected with a block of hardwood or lead hammer head. Place the block against the end of the Mandrel and strike the block forceful blows with a sledge hammer until the Mandrel begins to slide.

7. When the Mandrel is free, attach a soft line or wire rope sling just below the shoulder, and support the weight as the Mandrel is removed.
8. Remove the Mandrel and lay it aside.
9. Remove the Mandrel Body (4) from the vise, and lay it aside.
10. Examine the Mandrel Seal Assembly, consisting of the Seal (10), Seal Protector Ring (11) and Seal Non-Extrusion Ring (12). There are two of these Seal assemblies in tandem: one pair in the upper end of the Mandrel Body (4) and a pair in the Washpipe Body (6). Check this Seal assembly for wear or damage. Remove the O-Ring Seals (10), Seal Protector Rings (11) and Non-Extrusion Rings (12) that show signs of wear or have deteriorated.

To remove these Rings, proceed as follows:

Using either Tool No.626 or No. 625, carefully insert the tip of the blade between the O-Ring and the Seal Protector Ring. Then lift out the O-Ring, taking care not to damage or mar the Seal Protector Rings or Non-Extrusion Rings. Do not run the tool around the groove under the Rings. Avoid damage by scratching the Ring grooves. Refer to Figure 1.

11. With the O-Ring removed from the above-named assemblies, examine visually for any distortion or damage. With the forefinger carefully feel the Seal Protector and Non-Extrusion Rings for damage or burrs.
12. Remove all damaged rings.
13. Carefully wash and clean all disassembled parts in solvent. Wipe dry with a clean cloth, then thoroughly oil with a good grade of light clean oil.

14. Check all parts for defects. Examine the polished surfaces for pits and/or scratches. Any abrasions on these surfaces will damage the O-Ring Seals, resulting in a loss of fluid during the operation of the tool. Mandrel or Washpipe polished surfaces that have become pitted or abraided must be replaced with new parts before reassembly.
15. Check splines on the bottom of the Mandrel Body for upset. Upsets may be ground off with a grinder or with a small hand file.

Reassembly

Note: The two Fill Plug Seals (9) should be replaced before the Fill Plugs (7 and 8) are reassembled. Seals and oil, once removed, should never be reused.

1. All metal parts should be thoroughly steam cleaned, or washed inside and out with a good grade solvent; blown dry with shop air, or wiped

clean with soft cloths. The parts should then be thoroughly oiled with a good grade, clean light oil.

Note: Always lubricate the threads with an approved thread lubricant (KOPR-KOTE®).

2. Prior to the main reassembly, the Bowen Non-Extrusion Seal Assemblies should be installed in the Mandrel Body (4) and Washpipe Body (6). This may be done in the following manner. (Refer to Figures 2 through 16 for step-by-step illustrations)

Non-Extrusion Rings are installed first with their beveled surfaces conforming to the beveled surfaces of the groove. The Seal Protector Rings are installed next, deformed slightly to permit entry into the body, then straightened and flattened by use of Tool #625. After Non-Extrusion Rings and Seal Protector Rings are in place, the rubber O-Ring is inserted in the middle of the assembly between the two Seal Protector Rings. The complete assembly is then properly set with a Ring Setting Tool.

3. Repeat the sequence as shown in Figures 2–9 on pages 9 and 10 for the upper Main Mandrel Seal.
4. With both Seal Assemblies in place and pressed into the grooves as best as possible with your hands and the Installation Tool #626, use the Seal Assembly Setting Tool to set the Seals properly.
5. After the Non-Extrusion Seal Assemblies have been installed in both Mandrel Body and Washpipe Body as outlined in 2 through 4 above, use the Setting Tool, Figure 14, to conform the Seal Rings to proper bore size. Refer to Figures 14, 15, and 16.



Figure 1
O-Ring Removal with Tool No.625

Insert lip of tool under O-Ring and force O-Ring out of the groove. Be careful not to damage or distort Seal Protector Rings or Non-Extrusion Rings. Many operators prefer to use O-Ring Tool No. 625 for O-Ring removal due to its configuration.

6. Secure the Mandrel Body (4) horizontally in a vise. Coat the polished surface thoroughly with a good clean lightweight oil.
7. Install the Washpipe Seal (16) on the lower end of the Mandrel (1).
8. Insert the splined end of the Mandrel (1) through the top of the Mandrel Body (4); and, aligning the splines, shove it through the splines in the Mandrel Body (4). Push it gently through until the Mandrel (1) bumps against the Mandrel Body. This will bring the polished portion of the Mandrel through the Seal Ring assemblies previously described. The Mandrel should slide freely back and forth. If any unusual resistance is encountered, remove the Mandrel and reset the Seal Assemblies or remove any foreign matter. Do not force the Mandrel, as damage may result to the Seal surface.
9. Install the Large Middle Body Seal (14) and Small Middle Body Seal (15).
10. Oil and install the Knocker (2) on the lower Mandrel end. Buck up tight.

CAUTION: The Knocker is designed with appropriate wrench flats, usually six. Use them. DO NOT wrench on the hardfaced bands between the flats, or gouge into them with the sides of the wrench jaws. These hardfaced bands are engineered to lend lateral stabilization to the Knocker when in service. They are manufactured to close grinding tolerances, and should never be upset or otherwise damaged. In the event that they are inadvertently upset in handling, remove the upset or burr with a hand file or fine emery cloth, then clean and re-oil.

11. Screw the Washpipe (3) onto the

Mandrel. Buck up tight. Use the same care with the Washpipe as described for the Knocker. It also is designed with stabilizer bands.

12. Coat the Washpipe (3) thoroughly with light oil.
13. Slide the Middle Body (5) over the Washpipe and lower Mandrel end, and mate it up with the Mandrel Body. Make up tight.
14. Assemble the Large Middle Body Seal (14) and the Small Middle Body Seal (15) on the upper end of the Washpipe Body (6).
15. Slip the Washpipe Body over the Washpipe (3). Use the same care as described in (9) for the Mandrel. Buck up tight in lower end of Middle Body (5).
16. Any good grade medium-weight lubricating oil will serve the Lubricated Bumper Sub. Best results are obtained from SAE 70 weight, non-foaming lubricating oil; and this is recommended.

This recommendation may be modified to allow a lighter weight oil in small Subs used in relatively low temperature and heavier weight oil in very deep holes, high temperature conditions or very large Subs.

Note: Bowen Tools has available a special viscosity index oil which is particularly well suited to service in very high well temperatures. This oil is available at extra cost on request.

The oil used to fill the Lubricated Fishing

Bumper Sub should be completely clean and free from foreign matter. Never reuse oil or seals when assembling a Bumper Sub.

To Fill the Lubricated Fishing Bumper Sub

Prop the assembled tool up at approximately a 30° angle with the Mandrel end up. Have both the Middle Body Fill Plug (8) and Mandrel Body Fill Plug (7) at the top, if possible. Attach the Exhaust Hose Assembly (33435) to the Mandrel Body Fill Plug hole, and the Volume Pump Hose (2581) to the Middle Body Fill Plug hole. Place the free end of the Exhaust Hose into a receptacle. Fill the Volume Pump (2580) with oil and connect it to the Volume Pump Hose.

Pump into the tool at a moderate speed to allow uniform smooth flow of oil.

As the tool fills, oil will begin to flow out the Exhaust Hose. Air bubbles will be observed in the exhaust oil. Continue to pump until all air bubbles cease to appear in the outflowing oil.

When air bubbles cease, immediately detach the Exhaust Hose, and insert the Fill Plug (7) in Mandrel Body (4). Tighten this Fill Plug good and snug, but not excessively tight. Detach the Volume Pump Hose and install Fill Plug (8).

The tool will now be ready for service.

Before the tool is actually put in service, it should be worked back and forth several times to assure that it is functioning properly and that all seals are leak-proof.

If the tool is to be stored for future service, the tool joints should have a good grade thread dope applied and thread protectors installed. The outside of the tool should be cleaned and painted or a good heavy coat of grease applied prior to storage. If the climate is very damp or salty, the bore should be thoroughly greased.

Installation of Non-Extrusion Rings

- a. Carefully examine each Non-Extrusion Ring before installation and remove any burrs or rough edges with a small hand file.



Figure 2

- b. Hold Non- Extrusion Ring between thumbs and forefingers.



Figure 3

- c. Overlap ends until diameter is small enough to fit inside body.



Figure 4

- d. Place edge of Ring opposite the split into the lower groove and spread from center toward ends. Be sure beveled side of Ring matches beveled groove side.



Figure 5

- e. Using thumbs, press Ring into groove until ends match up and Ring is firmly seated in groove.

Installation of Seal Protector Rings

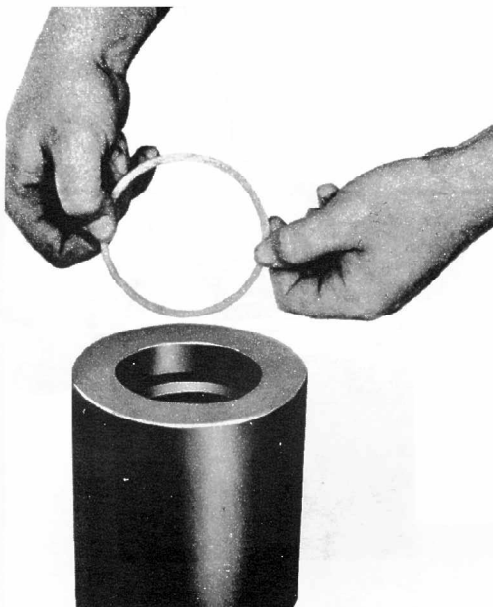


Figure 6

- f. Figure 6 shows Ring before being bent. It will look like this after it is properly installed in the groove.



Figure 8

- h. Insert one edge in groove. Then insert the opposite edge and press down until entire Ring is in place.



Figure 7

- g. Bend the Ring until it is small enough to allow entry into bore.



Figure 9

- i. Use Seal Protector Ring installation tool to straighten and flatten Ring by pressing against Ring as shown.

Installation of O-Ring Packing



Figure 10

j. Figure 10 shows O-Ring packing before installation.



Figure 11

k. Bend O-Ring as shown to insert in groove



Figure 12

l. Insert O-Ring between Seal Protection Rings in each groove.

Setting Seal Ring Assemblies

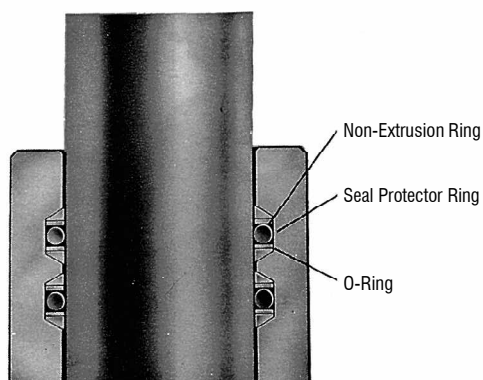


Figure 13

This illustration shows the location of parts of the patented Bowen Seal Ring Assembly.



Figure 14

- a. Use the Setting Tool from the Service Kit (see page 14) to seat the Seal Ring Assemblies after installation.



Figure 15

- b. Insert the Setting Tool as shown, using any convenient rod or bar to hold tool.

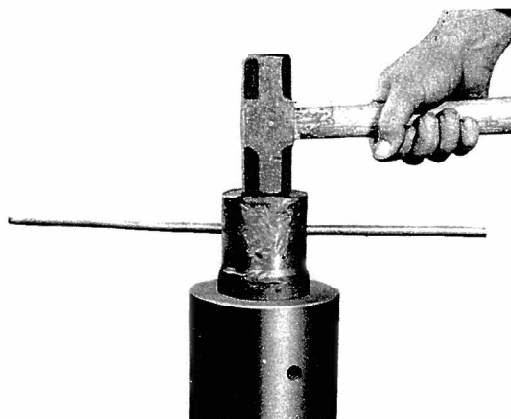


Figure 16

- c. Tap several times around periphery of tool as shown to set Rings. Continue until both Ring Assemblies are seated. Then remove tool and continue assembly.

Strength Data

Assembly Number	O.D. (inches)	I.D. (inches)	Connection	Tensile Strength (Yield) lbs	Yield Torque (ft-lbs)	
					Bumper Sub	Max. Operating Torque (ft-lbs)
54781	1-13/16	3/8	1-13/16" Wilson FJ	75,400	480	240
41490	2-1/4	3/8	1-1/4" API Reg.	116,415	1,740	870
43501	3-1/8	1	2-3/8" API Reg.	239,070	3,400	1,700
39712	3-3/8	7/8	2-3/8" API IF	321,000	6,060	3,030
43470	3-3/4	1-1/2	2-3/8" API IF	300,750	7,100	3,550
43521	3-3/4	1-7/8	2-3/8" EUE	291,735	4,920	2,460
43509	3-3/4	1-1/4	2-7/8" API Reg.	363,780	7,100	3,550
43531	4-1/4	1-15/16	2-7/8" API IF	397,650	9,260	4,630
42700	4-1/2	2-3/8	2-7/8" EUE	388,650	7,100	3,550
39727	4-5/8	2	3-1/2" API FH	484,650	11,030	5,518
39727	4-3/4	2	3-1/2" API FH	484,650	15,000	7,500
152719	4-3/4	2-1/4	3-1/2" API IF	433,000	15,000	7,500
39732	5-3/4	2-13/16	4-1/2" API FH	622,295	23,000	11,500
39732	6	2-13/16	4-1/2" API FH	622,295	23,000	11,500
39737	6-1/4	3-1/8	4-1/2" API IF	777,150	32,600	16,300
39778	6-3/4	2-3/4	5-1/2" API Reg.	1,130,400	43,200	21,600
39752	7-3/4	3-1/2	6-5/8" API Reg.	1,276,950	62,400	31,200

The above tensile strengths are calculated theoretical yield strengths and are considered accurate to $\pm 20\%$.

The above operating torque is set at 50% of the calculated theoretical yield torque and is the maximum recommended operating torque.

The figures do not constitute a guarantee, actual or implied; they are meant to serve as a guide only, and appropriate allowance must be made in use, as a safety factor.

Maximum Recommended Tightening Torque for Threaded Connections

Jar Assembly No.	Jar O.D. X I.D. (in)	Top Sub	Knocker	Mandrel	Mandrel Body	Middle Body
		to Mandrel (ft-lbs)	to Mandrel (ft-lbs)	to Washpipe (ft-lbs)	to Middle Body (ft-lbs)	to Washpipe Body (ft-lbs)
54781	1-13/16 x 3/8	240	—	—	370	370
41490	2-1/4 x 3/8	—	90	140	870	870
39712	3-3/8 x 7/8	—	460	530	3,030	3,170
43501	3-1/8 x 1	—	430	660	1,700	1,700
43509	3-3/4 x 1-1/4	—	580	500	3,550	3,550
43470	3-3/4 x 1-1/2	—	410	490	3,550	3,550
43521	3-3/4 x 1-7/8	—	330	1,220	2,460	2,460
43531	4-1/4 x 1-15/16	—	670	730	4,630	4,630
42713	4-1/4 x 2	—	650	1,440	3,160	3,160
42700	4-1/2 x 2-3/8	—	370	1,450	3,550	3,550
39727	4-5/8 x 2	—	1,100	1,690	5,518	5,518
39727	4-3/4 x 2	—	1,100	1,690	7,500	7,500
152719	4-3/4 x 2-1/4	—	1,000	1,500	7,500	7,500
39732	5-3/4 x 2-13/16	—	2,270	3,800	11,500	11,500
39732	6 x 2-13/16	—	2,270	3,800	11,500	13,500
39737	6-1/4 x 3-1/8	—	3,120	9,750	16,300	16,300
39778	6-3/4 x 2-3/4	—	3,000	13,300	21,600	22,600
39752	7-3/4 x 3-1/2	—	7,690	21,000	31,200	31,200

The above makeup torques are the maximum recommended makeup torques for each connection. They are set at 50% of the calculated theoretical yield torque. Torques this high are not required for all fishing jobs, and lower values will result in less wear and tear to the threads.

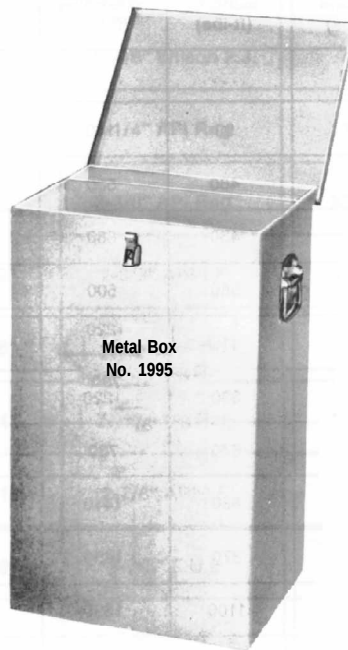
The tightening torque values were calculated assuming Itcolube or similar zinc based grease on all threads and shoulders.

Service Kit

A Bumper Sub Service Kit is necessary to properly service the Bumper Sub. These Kits are identical for every size of Bumper Sub, so one kit may be used for any number of subs. The kit **does not** include any Seal Setting Tool, two of which are required for each size Bumper Sub. These tools must be ordered separately. They are usually stored in the Service Kit.



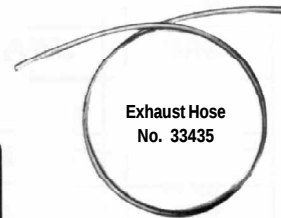
Volume Pump
No. 2580



Metal Box
No. 1995



Volume Pump Hose
No. 2581



Exhaust Hose
No. 33435



Mandrel Body
Setting Tool
(extra)

NOT INCLUDED IN SERVICE KIT



Seal Protector Ring
Installation Tool
No. 625



O-Ring
Installation Tool
No. 626



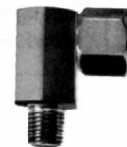
Mandrel Body
Fill Plug Wrench
No. 359



Middle Body
Fill Plug Wrench
No. 620



Nipple
No. 36953



Reducing
Right-Angle Adapter
No. 56564



Volume Pump
Repair Kit
No. 53266
(extra)

Male Coupler
No. 656



Sub
No. 2582



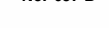
Adapter (3/8)
No. 657-A



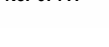
Female Coupler
No. 655



Adapter (1/4)
No. 657-B



Adapter
No. 674-A



Adapter
No. 674-B



Line Filter
No. 56565



Bushing
No. 56563



Filter Element
No. 56566 (extra)



Tube Fitting
No. 33436

Lubricated Fishing Bumper Subs Specifications

Size Connections		1-13/16	1-1/4	2-3/8	2-3/8	2-7/8	2-3/8	2-3/8	2-7/8
		Wilson	API	API	API	API	API	EUE	API
		FJ	Reg.	Reg.	IF	Reg.	IF		IF
Outside Diameter in Inches		1-13/16	2-1/4	3-1/8	3-3/8	3-3/4	3-3/4	3-3/4	4-1/4
Inside Diameter in Inches		3/8	3/8	1	7/8	1-1/4	1-1/2	1-7/8	1-15/16
Stroke in Inches		10	10	15-1/2	15-1/2	15-1/2	15-1/2	15-1/2	15-1/2
Full Bore		No	No	Yes	No	Yes	Yes	Yes	Yes
Complete Assembly	Part No.	54781	41490	43501	39712	43509	43470	43521	43531
	Weight	50	70	209	180	254	250	294	294

Replacement Parts

Top Sub	Part No.	36811	—	—	—	—	—	—	—
	Weight	3	—	—	—	—	—	—	—
Mandrel Body	Part No.	36742	41491	43502	39060	43510	43471	43522	43532
	Weight	9	12	33	41	38	51	56	45
Middle Body	Part No.	36744	41492	43503	39061	43511	43472	43523	43533
	Weight	10	13	30	31	35	37	42	40
Washpipe Body	Part No.	54783	41493	43504	39713	43512	43473	43524	43534
	Weight	18	23	50	43	55	58	63	67
Mandrel	Part No.	53721	41520	43506	39064	43514	43475	43526	43536
	Weight	10	14	63	30	77-1/2	69	78	88
Washpipe	Part No.	*	41495	43505	39714	43513	43474	43525	43535
	Weight		8	25	22	30	30	48	48
Non-Extrusion Ring	Part No.	365-19	365-24	365-32	365-33	365-35	365-36	365-37.5	365-40
	Weight	1/16	1/16	1/16	1/16	1/16	1/8	1/8	1/8
	No. Req'd.	4	8	8	8	8	8	8	8
Seal Protector Ring	Part No.	375-19	375-24	375-32	375-33	375-35	375-36	375-37.5	375-40
	Weight	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
	No. Req'd.	4	8	8	8	8	8	8	8
Mandrel Body Fill Plug	Part No.	617	329	329	329	329	329	329	329
	Weight	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8
Middle Body Fill Plug	Part No.	617	617	10641	689	617	617	617	617
	Weight	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8
Knocker	Part No.	—	41845	43508	39066	43516	39845	43528	43538
	Weight	—	1/2	5	3-1/2	5	5	6	6
Seal Packing Set	Part No.	54784	41846	43519	39715	43517	39720	43529	43539
	Weight	1/2	1/2	1	1	1	1	1	1

Required Accessories - Extra

Service Kit	Part No.	21279	Same Service Kit (55403) is required to service all sizes of tools. It does NOT include any seal setting tool, which must be ordered separately as required for each tool, at extra cost.						
	Weight	75							
Setting Tool	Part No.	22709-19	22709-24	22709-32	22709-33	22709-35	22709-36	22709-37.5	22709-40

* Mandrel and Washpipe are a one-piece Assembly.

Lubricated Fishing Bumper Subs Specifications (Continued)

Complete Assembly	Part No.	54781	41490*	43501	39712	43509	43470	43521	43531
	Weight	50	70	209	180	254	250	294	294

Replacement Parts (Continued)

Seal Packing Set	Part No.	54784	41846	43519	39715	43517	39720	43529	43539
Consists of:	Weight	1/2	1/2	1	1	1	1	1	1
Main Mandrel and Washpipe Body Seal (4 Req'd.)	Part No.	568211	568219	568329	568330	568332	568333	568334	568337
		2 Req'd.							
Middle Body Seal (Large) (2 Req'd.)	Part No.	568029	568224	568231	568232	568235	568235	568236	568239
Middle Body Seal (Small) 2 Req'd.)	Part No.	568027	568222	568229	568230	568233	568233	568233	568237
Washpipe Seal	Part No.	—	568210	568220	568218	568222	568223	568229	568227
Middle Body Fill Plug Seal	Part No.	568005	568005	—	568005	568005	568005	568005	568005
Mandrel Body Fill Plug Seal	Part No.	568005	568006	568006	568006	568006	568006	568006	568006

* 41490 Assembly does not use a Mandrel Ring or Mandrel Assembly

How To Order

Specify:

- (1) Name and number of assembly or part
- (2) Size and type of connection, if other than standard
- (3) Outside diameter, if other than standard
- (4) Any spares, optional or extra parts, by name and number

RECOMMENDED SPARES:

- (1) 1 Service Kit
- (2) 6 Seal Packing Sets
- (3) 4 Middle Body Fill Plugs
- (4) 4 Mandrel Body Fill Plugs
- (5) 16 Main Mandrel Non-Extrusion Rings
- (6) 16 Main Mandrel Seal Protector Rings
- (7) 1 Seal Ring Setting Tool

Lubricated Fishing Bumper Subs Specifications (Continued)

Size Connection	2-7/8	3-1/2	3-1/2	4-1/2	4-1/2	5-1/2	6-5/8
	EUE	API FH or IF	API IF	API FH	API FH or IF	API Reg.	API Reg.
Outside Diameter in Inches	4-1/2	4-3/4	4-3/4	6	6-1/4	6-3/4	7-3/4
Inside Diameter in Inches	2-3/8	2	2-1/4	2-13/16	3-1/8	2-3/4	3-1/2
Stroke - Inches	15-1/2	15-1/2	11	18	18	18	18
Full Bore	Yes	No		Yes	No	No	No
Complete Assembly	Part No.	42700	39727	152719	39732	39737	39778
	Weight	304	333	300	560	565	700
							816

Replacement Parts (Continued)

Top Sub	Part No.	—	—	—	—	—	—
	Weight	—	—	—	—	—	—
Mandrel Body	Part No.	42701	39861	39861	30541	34966	33244
	Weight	40	62	62	100	77	99
Middle Body	Part No.	42702	33156	33156	30542	34967	33245
	Weight	44	50	50	84	88	103
Washpipe Body	Part No.	42703	39728	152720	39733	39738	39779
	Weight	70	74	75	117	126	148
Mandrel	Part No.	42705	39860	152722	30545	34970	33248
	Weight	92	105	95	181	191	250
Washpipe	Part No.	42704	39729	152721	39734	39739	39780
	Weight	50	40	40	69	75	90
Non-Extrusion Ring (8 Req'd.)	Part No.	365-43	365-42	365-42	365-50.25	365-53	365-54
	Weight	1/8	1/8	1/8	1/8	1/8	1/8
Seal Protector Ring (8 Req'd.)	Part No.	375-43	375-42	375-42	375-50.25	375-53	375-54
	Weight	1/16	1/16	1/16	1/16	1/16	1/16
Mandrel Body Fill Plug	Part No.	329	329	329	329	329	329
	Weight	1/8	1/8	1/8	1/8	1/8	1/8
Middle Body Fill Plug	Part No.	617	617	617	617	617	617
	Weight	1/8	1/8	1/8	1/8	1/8	1/8
Knocker	Part No.	42708	39863	39863	30546	34972	33250
	Weight	6	6-1/2	6-1/2	7	7	8
Seal Packing Set	Part No.	42709	39730	153074	39735	39740	39781
	Weight	1	1	1	1	1-1/2	2

Required Accessories - Extra (Continued)

Service Kit	Part No.	55403	Same Service Kit (55403) is required to service all sizes of tools. It does NOT include any seal setting tool, which must be ordered separately as required for each tool, at extra cost.				
	Weight	75					
Setting Tool	Part No.	22709-43	22709-42	22709-42	10572	22709-53	22709-54
							22709-61

Lubricated Fishing Bumper Sub Specifications (Continued)

Complete Assembly	Part No.	42700	39727	152719	39732	39737	39778	39752
	Weight	304	333	300	560	565	700	816

Replacement Parts (Continued)

Seal Packing Set	Part No.	42709	39730	153074	39735	39740	39781	39755
Consists of:	Weight	1	1	1	1	1-1/2	2	2
Main Mandrel and Washpipe Body Seal (4 Req'd.)	Part No.	568340	568339	568339	568347	568426	568427	568434
Large Middle Body Seal (2 Req'd.)	Part No.	568242	568242	568242	568250	568253	568256	568261
Small Middle Body Seal (2 Req'd.)	Part No.	568239	568239	568239	568247	568251	568254	568260
Washpipe Seal	Part No.	568231	568229	568231	568236	568239	568238	568246
Middle Body Fill Plug Seal	Part No.	568005	568005	568005	568005	568005	568005	568005
Mandrel Body Fill Plug Seal	Part No.	568006	568006	568006	568006	568006	568006	568006

How To Order

Specify:

- (1) Name and number of assembly or part
- (2) Size and type of connection, if other than standard
- (3) Any spares, optional or extra parts, by name and number

RECOMMENDED SPARES:

- (1) 1 Service Kit
- (2) 6 Seal Packing Sets
- (3) 4 Middle Body Fill Plugs
- (4) 4 Mandrel Body Fill Plugs
- (5) 16 Main Mandrel Non-Extrusion Rings
- (6) 16 Main Mandrel Seal Protector Rings
- (7) 1 Seal Ring Setting Tool

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* Denotes Manufacturing and Engineering facilities

Downhole Solutions

Drilling Solutions

Engineering and Project Management Solutions

Lifting and Handling Solutions

Production Solutions

Supply Chain Solutions

Tubular and Corrosion Control Solutions

Well Service and Completion Solutions